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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,680	04/21/2006	Reinhard Kuhne	KUHNE 3	5695

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EXAMINER
GIARDINO JR, MARK A

ART UNIT	PAPER NUMBER
4113	

MAIL DATE	DELIVERY MODE
11/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>*1-17*</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>*1-17*</u> is/are rejected.

7)☒ Claim(s) <u>*1-7 and 10-11*</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>*21 April 2006*</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>*4/21/2006*</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

The instant application contains the following number of claims:

Number of independent claims: **1**.

Number of total claims: **17**.

Number of elected independent claims: **1** (withdrawn claims not included).

Number of total elected claims: **17** (withdrawn claims not included).

Specification

The disclosure is objected to because of grammatical errors: "the latter would 256 byte" (Page 3), "the latter would 256 byte" (Page 3), and "are is stated" (Page 4). Correction is required.

Claim Objections

Claims 1-7 are objected to because of the following informalities: the abbreviations (ZT) for allocation table, (RBA) for physical block address, and (RSA) for physical sector address are not commonly used and would be confusing to a person of ordinary skill in the art. The examiner suggests removing them or reassigning the abbreviations or providing a glossary. Appropriate correction is required.

Claims 10-11 objected to because of the following informalities: the phrase "has 32 byte" is not grammatically correct. The phrase has been construed as "has 32 bytes." Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 9, it is unclear what is meant by "the sector position with the highest item number is". Particularly, the word "item" must be further explained. The claim has been construed as if the entire phrase reads, "the sector positions are".

Regarding Claims 14-17, "sector table" and "sector mask," it is unclear exactly how they are used in the invention. The examiner has construed a sector table as a table with a bit per sector that allows writing to the memory device byte-by-byte and a sector mask as a mask with one bit per bit in the memory that allows writing to the memory device bit-by-bit.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Estakhri et al (US 5,930,815).

Regarding Claim 1, Estakhri teaches a method for writing memory sectors in individually-deletable memory blocks (see description of how a block must be deleted in solid state memory, Column 2 Lines 20-23), comprising a number of memory sectors (Column 4 Lines 39-45), whereby access to the physical sectors is achieved by means of an allocation table for address conversion of a logical address into a physical block address and a physical sector address (such functionality is inherently present, see Figures 16 and 17, where separate sectors – 0 and 5 – are written to the same physical block), and whereby when a sector write command is to be carried out, which relates to an already written sector, the writing takes place to an alternative memory block by means of an altered address conversion (Column 14 Lines 45-61), characterized in that the writing processes for sectors in the alternative memory block are carried out sequentially (writes to the alternative memory block are sequential, otherwise the entire block would have to be erased and rewritten each write, which does not happen with multiple writes, see Figures 19-20 and corresponding description on Column 17 Lines 26-34) and the position of the relevant sector in the alternative block is stored in the sector table (see Table 714 in Figures 15-21).

Regarding Claim 2, Estakhri teaches all limitations of Claim 1, characterized in that the altered address conversion is carried out by means of a data record with a physical block address and a sector table (the space manager chooses a physical block address, see Column 14 Lines 45-61, and the block and sector table are stored in table 700) in the internal storage of a memory controller (the space manager is in controller 506, see Column 8 Line 66 to Column 9 Line 4).

Regarding Claim 3, Estakhri teaches all limitations of Claim 1, characterized in

that the sector is organized as an index table (table 714 serves as an index table),

wherein the physical sector address serves as an index (the sector address of the

moved block serves as an index to the sector address of the rewritten data, see Column

16 Lines 45-61 and Figures 17-18) and the valid sector position in the alternative block

is indicated at the corresponding position in the table (see Figures 17-18, where the

valid sector position is indicated in table 714).

Regarding Claim 4, the phrase "highest possible value" is considered non-

functional descriptive material and has been given no patentable weight. Estakhri

teaches all limitations of Claim 3, characterized in that a value (the value '0' in Estakhri)

assigned to a sector address in the index table indicates that the corresponding sector

remains unchanged in the original memory block (see Figures 17-18 and accompanying

description on Column 16 Line 45-61). The value '0' used in Estakhri is equivalent to

the value 'FF' (as used in applicant's specification) for indication purposes.

Regarding Claim 5, Estakhri teaches all limitations of Claim 1, characterized in

that the sector table is organized as a search table (table 714 serves as a search table),

each table entry of which indicates the physical sector address with the corresponding

valid sector position in the alternative block (the position of each entry in the table

indicates the physical sector address in the alternative block and the binary value

indicates the validity of such a block, see Figures 17-18 and Column 16 Lines 45-61).

Regarding Claim 6, Estakhri teaches all limitations of Claim 5, characterized in

that the search table is sorted by physical sector addresses (table 714 is sorted such

that as one moves from left to right on Figures 17-18, the physical sector address

increases).

Regarding Claim 7, Estakhri teaches all limitations of Claim 1, characterized in

that the position of the sector within the alternative block is also stored in the

administrative part of the sector (table 714 stores the position of the moved sector within

the alternative block, and each entry of table 714 is also an administrative part of the

corresponding sector).

Regarding Claim 8, Estakhri teaches all limitations of Claim 7, characterized in

that the sector table of a block is reconstructed from the sector positions stored in the

administrative part when the memory system is restarted (table 714 which contains the

sector tables of the blocks is stored in RAM, see Column 11 Lines 36-47, and this RAM

is continually shadowed and restored on power up, see Column 10 Line 66 to Column

11 Line 15).

Regarding Claim 9, Estakhri teaches all limitations of Claim 8, characterized in

that when restarting, the sector positions are registered in the sector table (table 714

which includes the sector positions in the sector table is stored in RAM, see Column 11

Lines 36-47, and this RAM is continually shadowed and restored on power up, see

Column 10 Line 66 to Column 11 Line 15).

Regarding Claim 12, Estakhri teaches all limitations of Claim 1, characterized in

that, as soon as the sector table is filled (according to a user defined threshold, Column

17 Lines 39-41), a new alternative block is searched for, to which the valid sectors from

the original memory block, together with those from the previous alternative block, are

then copied (Column 17 Lines 42-49).

Regarding Claim 13, Estakhri teaches all limitations of Claim 12, characterized in

that the new alternative block is registered in the allocation table as the original memory

block and the previous memory and alternative blocks are cleared for deletion (Column

17 Lines 52-54).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Estakhri in view of Asnaashari (US 5,928,370).

Regarding Claims 10 and 11, Estakhri meets all limitations of Claims 3 and 5 as

discussed above. However, Estakhri does not teach a memory block containing 256

sectors or index and search tables having 32 bytes. Asnaashari teaches a flash device

that contains a sector size of 256 bytes (Column 3 Lines 14-21 in Asnaashari). Since

Estakhri teaches one bit per sector in his index and search table, the size of each table

for such a sector size is 256 bits, or 32 bytes. It would have been obvious to a person

of ordinary skill in the art at the time the invention was made to have used a sector size

of 256 bytes. As motivation, Estakhri teaches 512 byte sector sizes but clearly states

that "other sector sizes may be employed" (Column 12 Lines 63-65 in Estakhri), and

since 256 was a well known sector size in the art, one of ordinary skill would have used

such a sector size. Also, limitations relating to size are not sufficient to distinguish over

prior art, see MPEP 2144.04 (IV) A.

Claims 14-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Estakhri in view of Kobatake (US 5,815,441).

Regarding Claim 14, Estakhri meets all limitations of Claim 1 as discussed

above. However, Estakhri does not teach a strategy indicator along with each logical

block address, indicating whether a sector mask or a sector table have last been used

for the latter. Kobatake teaches a memory where data can be written in bit-by-bit or

byte-by-byte mode (Column 1 Lines 27-30 in Kobatake), the first of which corresponds

to a sector mask and the latter of which corresponds to a sector table. The presence of

the word 'mode' means that some flag to indicate which mode the memory device is

currently in is inherently present. It would have been obvious to a person of ordinary

skill in the art at the time the invention was made to have used such an indicator in each

logical block address to indicate whether a sector mask or sector table had last been

used. As motivation, an indicator is necessary for knowing whether the memory device

is writing in bit-by-bit or byte-by-byte mode to ensure consistent and reliable operation.

Regarding Claim 15, the combined device meets all limitations of Claim 14 as

described above, and it would have been obvious to one of ordinary skill in the art that,

when given a choice of two ways to write to the memory device, the memory device

must be initialized to one of the two ways. A sector mask allows for greater flexibility,

since it allows for writing to the memory device bit-by-bit, so one of ordinary skill in the

art would choose the sector mask mode over the sector table mode.

Regarding Claim 17, the combined device meets all limitations of Claim 1 as

described above, and it would have been obvious to one of ordinary skill in the art that if

only a few sectors have been written to the alternative block system, and one of these

blocks is to be rewritten, to switch the administration of the alternative block from sector

mask to sector table. When writing in bytes, such as when rewriting a block, one of

ordinary skill in the art would change modes to a sector table for increased speed.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Estakhri

and Kobatake as applied to claims 14-15 and 17 above, and further in view of Chen (US

6,456,528).

Regarding Claim 16, the combined device meets all limitations of Claim 15 as

described above. However, Estakhri and Kobatake do not teach that if the memory

system is formatted as a FAT file system, the memory blocks are initialized with the

remark "sector table." Chen teaches that tables of memory data are commonly written

to in a FAT file system (Column 10 Lines 44-47 in Chen). It would have been obvious to

one of ordinary skill in the art that, if the memory system is formatted as a FAT file

system, to initialize the memory block with a remark indicating a sector table. As

motivation, the FAT file system overhead requires different treatment than the regular

data stored in the memory system, so one of ordinary skill in the art would realize that

an indicator must be present to distinguish between the overhead and the regular data.

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Estakhri (US 6,772,274) teaches storing address correlation

data in a table in a nonvolatile memory. Aasheim et al (US 2003/0163631) teaches

invalidating rewritten sectors and writing these sectors to the same block until the block

is full. Bennett et al (US 7,139,864) teaches an update block that stores data from
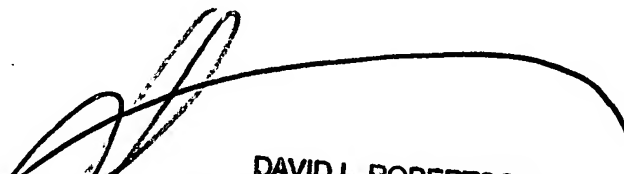
newly written sectors.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Mark A. Giardino whose telephone number is (571) 270-

3565. The examiner can normally be reached on M-R 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Robertson can be reached on (571) 272-4186. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M.A. Giardino

10/11/2007

DAVID L. ROBERTSON
SUPERVISORY PATENT EXAMINER